



PMRS

Users Guide



ATEX-TETRA-Hand-held Radio BHR 21 IS



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History

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1 General

The **BHR 21 IS** Hand-held radio set you acquired is a high-quality tool for radio communication in professional digital TETRA radio communications networks. It complies with all the requirements for operation in explosive areas.

These operating instructions describe the functions and user interface of the radio set. They will be updated according to the latest software version and can be obtained from the manufacturer as required.

In some topics of these operating instructions you will find references to various operational variants that depend on "preprogramming" or "personalization" of the radio set. This refers e.g. to the setting of the radio communications network parameters, functional variants and user-specific parameters (Phonebook, group list etc.).

Note



Please read the commissioning and operating instructions supplied with each BHR 21 IS radio set before using it.

These instructions provide all the relevant and mandatory safety instructions, information on operating conditions and service information.

Caution



The classification of hazardous areas according to zones in compliance with 1999/92EC is the responsibility of the user, on whose premises hazards of this kind exist or may arise or whose work involves or may involve such hazards.¹

Caution



Within the scope of the European directive 99/5/EC, the operator must ensure that the health protection and safety of the user of the terminal equipment and of other persons is guaranteed.²

Caution



With respect to the exposure of people to electromagnetic fields (110 MHz to 40 GHz), product standard EN 50385 must be applied.

¹ In compliance with directive 94/9/EC amendment I, item 1.0.6

² In compliance with article 3 (1)a of 99/5/EC and 1999/519/EC)



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1.1 Additional Safety Instructions

The BHR 21 IS meets the requirements of the ATEX –standard / Protection class II 2 G EEx ib IIC T4 as well as II 3D T130°C IP54.

You must not operate the device in areas that may be subject to metallic dust.

The EC-TYPE-EXAMINATION CERTIFICATE number is ZELM 06 ATEX 0319 X
A copy of the certificate is enclosed within the attachments and is to be considered.

Operate the BHR 21 IS with the battery pack BHR 21 IS (55000759), only then operating the device is admissible.

Do not recharge the battery within EX-zones (hazardous areas).

Changing the battery in EX-zone is always allowed.

Use the BHR 21 IS only if the antenna is undamaged and tightly screwed to the device.

You must not remove the antenna within EX-zones.

Exchanging the device's accessories in areas that might be subject to explosive dusts is not allowed.

The accessory connector on top of the device has to be shut by the sealing plug coming with the device or any other plug of an accessory that has been certificated by the manufacturer.

You must only use accessories for the device which have been certificated by the manufacturer for this purpose.

Do not use solvents or any other liquid substances for cleaning the device.

If any of these directions are not taken into consideration, operating the BHR 21 IS is not permitted.

Changes to the device's case are not admissible. If device or battery is damaged, the device has to be taken out of service. Same goes for lack damage to battery or face plate $>2\text{cm}^2$.

The battery must not be disassembled or discarded into fire.

Device and battery are to be taken out of service in case of malfunction or mechanical defect immediately. They are to be marked and removed from EX-zones.

Repairs may only be performed by the manufacturer (see page 2 for address). For further questions please contact your local vendor or the manufacturer.

1.2 Initial operation

Charge the Li Ion battery before the initial operation of the hand-held radio. You may charge the battery itself in a single or multiple charger as well as in combination with the radio.

At first you will have to apply the battery to the device by clicking it into the battery retainer. Now you can switch on the hand-held radio.

Operation of portable radio types BHR 21 IS need to be prepared and programmed before usage. Network and all other specific parameters for trunked mode operation (TMO) and/or direct mode operation (DMO) need a specific configuration for each radio which is related to actual regulations of



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the relevant network operator and all relevant regulations within the country of use including frequency regulations. Though firmware and software are included the radio has to be programmed for specific use by the means of the delivered personalisation tool originally manufactured and delivered from PMRS GmbH while setting all network relevant data, numbers, group assignments and other features. Personalisation must be conducted by authorized personnel or service partners who have been trained by PMRS GmbH and are able to show a valid authorisation certificate originally issued from PMRS GmbH. Loading of Firmware must be conducted while the battery is already fully charged.

Besides the battery the enclosed antenna is an essential part for accurate use of the radio. Operation of the radio must be executed while the antenna is fixed to the radio in the designated position to the antenna connector of the radio. Wetness, humidity and impurification of both the antenna connector of the radio and the antenna itself may cause severe damage or usage problems of the radio. It has to be assured that both connectors are dry and clean before fixing them to each other.

There is a leather carrying bag available for the BHR 21 IS. This bag has been especially developed for use in EX-zones and is part of the device's ATEX-certificate. The BHR 21 IS may be used as well as with or without this carrying bag in such areas. Only certificated carrying bags may be used for this purpose.

1.3 Directions for maintenance

The device is free of maintenance.

Note the storage conditions of the battery. A battery that has been left uncharged for a long period will permanently lose capacity. Therefore it should be recharged before a long period of storage. Before reaching the storage limit a battery has to be fully dis- and then recharged, thus the it stays functional and the storage limit has been reset.

Operating temperature	-20 °C...+55 °C	
Transport temperature	-40 °C...+70 °C	(short time)
Storage temperature	-20 °C...+60 °C	max. one month (without recharge)
	-20 °C...+45 °C	max. three month (without recharge)
	-20 °C +25 °C	max. one year (without recharge)



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2 Disposal

2.1 Rechargeable Batteries

This device is operated with a battery containing harmful substances. The battery must not be disposed of in your domestic refuse. After the service life of the battery has ended, it must be disposed of either via a PMRS customer service centre or via an appropriate collection point.

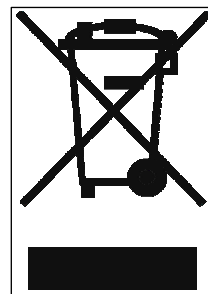
Heed the relevant regulations for environmental protection and disposal in the country of use.

2.2 Product Disposal

The products identified with the following icon are subject to the requirements of the German ElektroG Act.

The ElektroG Act combines the requirements of the following EC directives:

- 2002/96/EC (WEEE) for electric and electronic equipment wastes
- 2002/95/EC for restricting the use of specific hazardous substances in electronic equipment (RoHS directive).



Once the service life of a product has ended, this product must not be disposed of in the standard domestic refuse. Even disposal via the municipal collection points for electric and electronic wastes is not permitted.

In favour of an environmentally-friendly disposal or recycling of matters, PMRS GmbH has developed a disposal concept and fully assumes the duty of taking back and disposing of electric and electronic wastes according to the ElektroG Act on behalf of the manufacturer.

Please revert to your local service representative or directly to PMRS GmbH to dispose of the product.

Contact:

PMRS GmbH
Aussenstelle Berlin
Köpenicker Straße 325 Haus 201
12555 Berlin
Tel. +49 30 6576 2480
Fax +49 30 6576 2480



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3 Charging the Rechargeable Battery

Please ensure that your rechargeable battery is always charged to guarantee the reliability of your radio set at all times and the operability whenever required.

Caution



Caveat emptor

The warranty does not include damage caused by charging the rechargeable battery using charging devices of third-party manufacturers.

→ Exclusively use the charging devices designed for the product.

The rechargeable battery can be charged via the power supply interface of the radio set when inserted, or it can be charged separately. Since the rechargeable battery can be changed rapidly and easily, a BHR 21 IS Hand-held radio set can also be kept in permanent operation.

When you remove the rechargeable battery from the radio set while it is switched on, the last settings you made may be lost. For this reason, switch off the radio set before you remove the battery.

Push down the two locks (see figure to the right) to remove the battery. The battery can then easily be folded out to the rear and removed to the top. Analogously, for fitting the battery, first insert it into the bottom part of the Hand-held radio set and then press at the top until it engages.

Thereafter you can switch on the Hand-held radio set.



3.1 Charging in the Single-Unit Charging Device

The single-unit charging device provides the possibility of charging the battery separately or installed in the Hand-held radio set. For this purpose, the complete radio set or the battery must be placed into the single-unit charging device as shown in the figures to the right.

A lit red LED indicates that the charging device is ready for operation. The yellow LED is permanently lit while the battery is being charged.

After the battery has been charged by approx. 95 %, the yellow LED will go out. A flashing yellow LED indicates a fault or abort of the charging operation due to excess temperature.

The single-unit charging device is available as a separate piece of accessory.



3.2 Charging with the Travel Charging Device

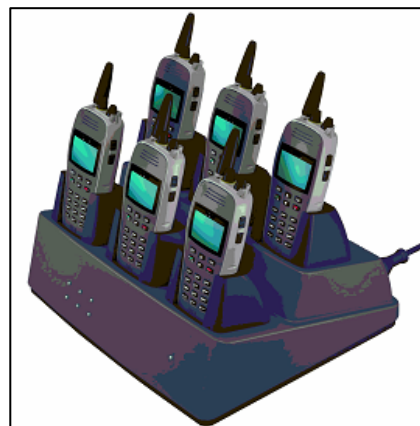
The rechargeable battery can be charged directly via a travel charging device. For this purpose, plug the connector of the charging device into the charging socket on the bottom side of the BHR 21 IS.

The charging operation is indicated through a pulsating battery icon in the header of the display. As soon as the charging process has been completed, the icon of the full battery is displayed.



3.3 Charging in the Multi-Unit Charging Device

The functions and handling of the multi-unit charging correspond to those of the single-unit charging device.





4 Switching On/Off the Hand-held radio Set

The BHR 21 IS Hand-held radio set is switched on by pressing the Escape/Clear key (key C) for an extended period of time (approx. two seconds). When the Hand-held radio set is switched on, the background lighting is activated as well. During the booting process, a start screen is displayed for approx. 3 seconds. At the same time, the radio set will start scanning for the digital TETRA radio communications network.

The antenna icon  flashes and the message "NETSEARCH" will be displayed.



After it has successfully registered in the radio network, the radio set is ready for operation. The icons for field strength, the antenna icon (constant) and the charging status of the battery are displayed.

The main field of the display indicating operational readiness displays the name of the preprogrammed network with the device number. Underneath it, the selected group or the preprogrammed clear text name ("group 12" in our example) will be displayed.



If the radio set was in direct mode (DMO) when it was switched off, it will return to direct mode as soon as it is switched on again. This is indicated through the  icon in the display header.



Press the Escape/Clear key for at least two seconds to switch off the radio set. The prompt "OFF?" will be displayed. If this prompt is confirmed by pressing the softkey "OK", the radio set will be switched off after a brief deactivation time.



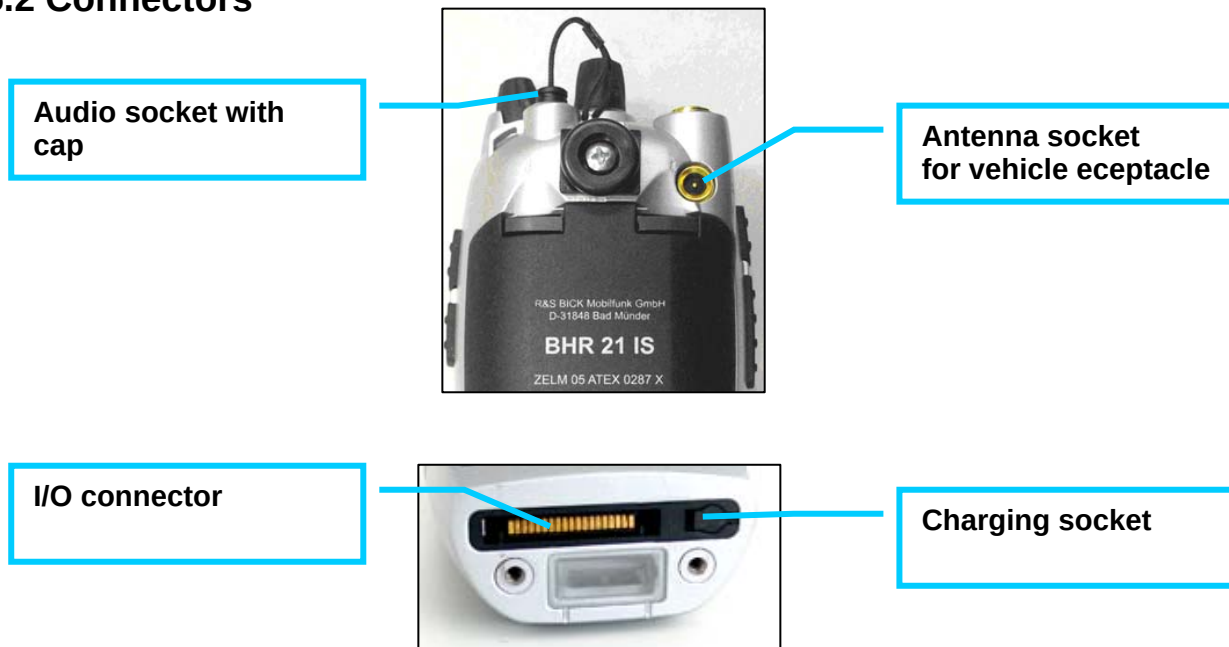
5 Controls of the BHR 21 IS

5.1 Layout of the Controls

The following overview shows the layout of the controls and their standard functions.



5.2 Connectors



5.3 Connecting Audio Accessories

On the top of the BHR 21 IS Hand-held radio set there is a 4-pin socket for connecting acoustic accessories such as microphone-loudspeakers, headphones, helmet headset etc. The connection socket is equipped with a cap as a protection against soiling.

Caution

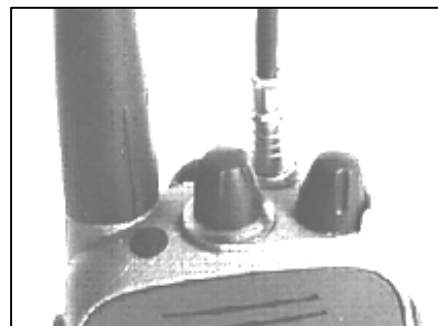


Caveat emptor

As a rule, only those accessories may be connected that have been approved by the manufacturer of the radio set and that have ATEX approval.

→ Exclusively use the accessories designed for the product.

Never exert force when plugging or pulling the connector. The mechanical coding of the socket and plug as well as the additional colour coding must be observed. A snap-on contact prevents accidental disconnection. Pull back the contact sleeve to disengage the connection, then gently pull off the connector. The radio set automatically detects plugged acoustic accessories. The acoustic paths are automatically switched when the accessories are connected/disconnected. A sequence of three tones signals the detection and switchover acoustically.





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Volume settings made for acoustic accessories are stored separately and automatically re-activated when the accessories are used again. This feature facilitates different volume settings for the radio set loudspeaker and the accessories.

You can use the PTT (push to talk) button on the accessories, or you can use the PTT button of the radio set (will remain in operation).

5.4 Illuminated Ring (LED)

On the top of the BHR 21 IS Hand-held radio set there is a colour display in a ring at the bottom of function button FS1 (select group switch). The different colour displays are to support the user especially during voice connections when only the top of the device is visible due to the way it is carried.

Description of the colour codes:

Green	Reception
Flashing yellow	Call signal, incoming call (ring tone)
Red	Authorization to talk, transmission
Red + green	Duplex mode active (telephone mode)



5.5 Keypad

The twelve-key, alphanumeric standard key pad is used for a context-sensitive input of digits, and in the text message editor also for letters and special characters.

5.6 Rotary Switches

Neither rotary switch on the top of the radio set features a mechanical stop. Once the limit position has been reached, a reject tone is output when an attempt is made to turn the switch any further. The following designations refer to the corresponding main function:

5.6.1 Select Group Switch (FS1)

Turn the Select Group switch (FS1) to jump to the list of all groups that are available in the current multi-group (group profile). In this list, you can turn the Select Group switch further to shift the selection line by line depending on the direction, in which you turn the switch.

Once a group has been selected, press the M/OK key (FT6) to determine this group as your own selected group. Confirming your selection with the PTT button initiates the setup of a group call to the selected group without registering this group as the selected group.

FS1



FS 2

5.6.2 Volume Control (FS2)

Turn the volume control (FS2) to directly change the volume of the radio set loudspeaker. The volume control menu will be displayed. Further turning will increase/decrease the volume further.

5.7 Function Keys/Buttons

In this context, all the function keys/buttons will be described that are not part of the twelve-key standard keypad.

5.7.1 Send Button PTT (FT2)

The various tasks of the send button PTT (push to talk) depend on the respective functional status of the radio set.

5.7.1.1 Status: Ready for Operation

When the radio set is ready for operation, pushing of the PTT button sets up a group call to the (own) selected group. In this status, the number or designation of this group is displayed in the bottom display line. If a group has not been selected, it is not possible to establish a group call simply by pushing the PTT button. Instead, a reject tone will be output.

5.7.1.2 Active Simplex Connection

During an active simplex connection in a group call or individual call, pushing of the PTT button signals the desire to talk over this connection. The PTT button must be kept pushed. Once the permission to send has been granted, a short tone will be output to indicate "ready to send", i.e. you can talk.

Release the PTT button to stop sending.

5.7.1.3 Active Duplex Connection

The PTT button does not have any function during an active duplex connection.

5.7.1.4 Input Confirmation

After a subscriber number has been entered via the keypad, selected in the phonebook, selected in the calling list or called list or after having selected a group in the Groups menu, the PTT button can be used to confirm your input and send the corresponding connection request to the infrastructure. Depending on the default call settings³ the PTT button either triggers a direct call with automatic call acceptance on the receiver side, or an individual simplex call with manual hook signalling (for individual calls in each case).

5.7.1.5 Call Acceptance

An individual call coming in with ring tone can be accepted by pushing the PTT button.



³ Please also refer to: Menu → Settings → Call parameters.



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5.7.2 Programmable Function Button 1 (FT1)

The FT1 button has not been assigned any function yet (default).

5.7.3 Function Button 3 (FT3)

5.7.3.1 Direct Access to the Group List

When the radio set is ready for operation, pressing function button FT3 will open the list of all the groups programmed in the selected multi-group and assigned dynamically. This function corresponds to that of rotary switch FS1.

5.7.3.2 Cursor Up in the Menu

Within the open menu system, function button FT3 is used for stepwise scrolling up the line selection (scroll up).

5.7.4 Function Button 4 (FT4)

5.7.4.1 Direct Access to the Volume Menu

When the radio set is ready for operation, pressing function button FT4 will open the menu for controlling the volume of the radio set loudspeaker.

5.7.4.2 Cursor Down in the Menu

Within the open menu system, function button FT4 is used for stepwise scrolling up the line selection (scroll down).

5.7.5 Softkeys Left (FT5) and Right (FT9)

The respective function of the left-hand softkey (FT5) and right-hand softkey (FT9) is indicated in the fields above the softkeys in the footer of the display.

When the radio set is ready for operation (see figure), the left-hand softkey is used to open the menu system and the right-hand softkey is used to open the phonebook.



In the menus for controlling the volume and the brightness, the left-hand softkey (FT5) is used for decreasing and the right-hand softkey (FT9) for increasing the selected parameter.



5.7.6 M/OK Key (FT6)



The various tasks of the M/OK key depend on the respective functional status of the radio set. For menu entries, this key is used for final confirmation of the input or for saving the selected setting.

5.7.6.1 Re-Dialling

When the radio set is ready for operation, pressing the M/OK key displays the subscriber number called last. The desired connection is then established via the M/OK key or the PTT button.

5.7.6.2 Input Confirmation/Call Setup

After a subscriber number has been entered via the keyboard, after a subscriber number has been selected in the phonebook or in Called List or Calling List, call setup to this number is initiated by pressing the M/OK button. Depending on the default call setting⁴, the OK key either triggers an individual simplex call with mandatory manual hook signalling, or a duplex call (for individual calls in each case).

5.7.6.3 Input Confirmation/Select Group

After a group has been selected in the Groups menu, this group is determined as the selected group via the M/OK key.

5.7.6.4 Call Acceptance

An individual call coming in with ring tone can be accepted by pushing the PTT button.

5.7.7 Scroll Up/Down Keys (FT7 and FT8)

5.7.7.1 Direct Brightness Control

When the radio set is ready for operation, the scroll keys are used for directly controlling the brightness of the display. A menu is not displayed for this purpose.

5.7.7.2 Cursor Functions

When the menu system is open and when lists are displayed, the scroll keys are used to select lines. The possibility of scrolling is indicated by icons above the scroll keys in the violet field in the footer of the display.

⁴ Please also refer to: Menu → Settings → Call parameters

5.7.8 Escape/Clear Key (FT10)



Depending on the function status of the radio set, the Escape/Clear key or delete key is used for the following purposes:

- Switching on the device by pressing the key for an extended period of time
- Terminating an existing individual call connection
- Deletion of the last input, or of the entire input when pressing the key for an extended period of time
- Return to the superordinate (previous) menu level
- Switching off the device by pressing the key for an extended period of time.

5.7.9 Emergency Call Button

To trigger an emergency call, the emergency call button must be pressed for a short time. The type of emergency call made depends on the default device configuration. The following emergency calls are possible: voice calls in the form of group calls to telephone subscribers or the transmission of an emergency message to an individual subscriber.



5.8 Key Lock



Pressing the hash key three times enables a key lock. The enabled key lock is indicated in the header of the display with a lock icon.

When a key is pressed while the key lock is enabled, a corresponding message will be displayed.

Only the emergency call button, the volume control and the hash key are still effective when the key lock is enabled. The hash key must be pressed three times again to unlock the keys.





6 Display

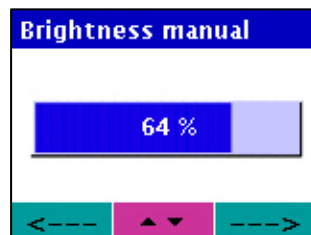
6.1 Brightness Control

When the radio set is ready for operation, the scroll keys are used for directly controlling the brightness of the display. A menu is not displayed for this purpose.

The menu system can also be used to change the brightness. Proceed as follows to do so:

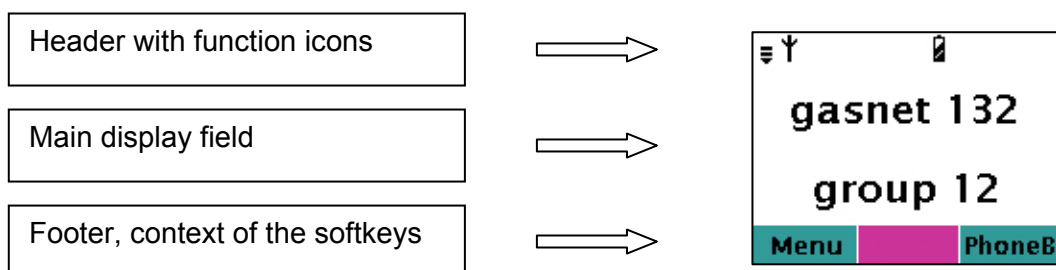
Menu → 6 Settings → 7 Volume and then continue with keys FT7 and FT8 for switchover.

The current brightness value will be displayed in percent and can be changed via the softkeys.

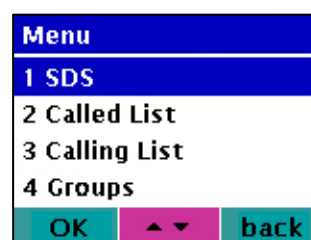


6.2 Display Structure

The display is subdivided into three areas:



When entering the menu system, the header displays the name of the respective menu. Once you are in the menu system, the available submenus are displayed in the main display field in the form of a list. These can be selected using the scroll keys or by entering the leading line number. Confirm your selection by pressing the respective softkey.



In all the display formats, the footer always displays the context-sensitive functions of the softkey as well as the available scrolling or browsing options.



6.3 Icon Area

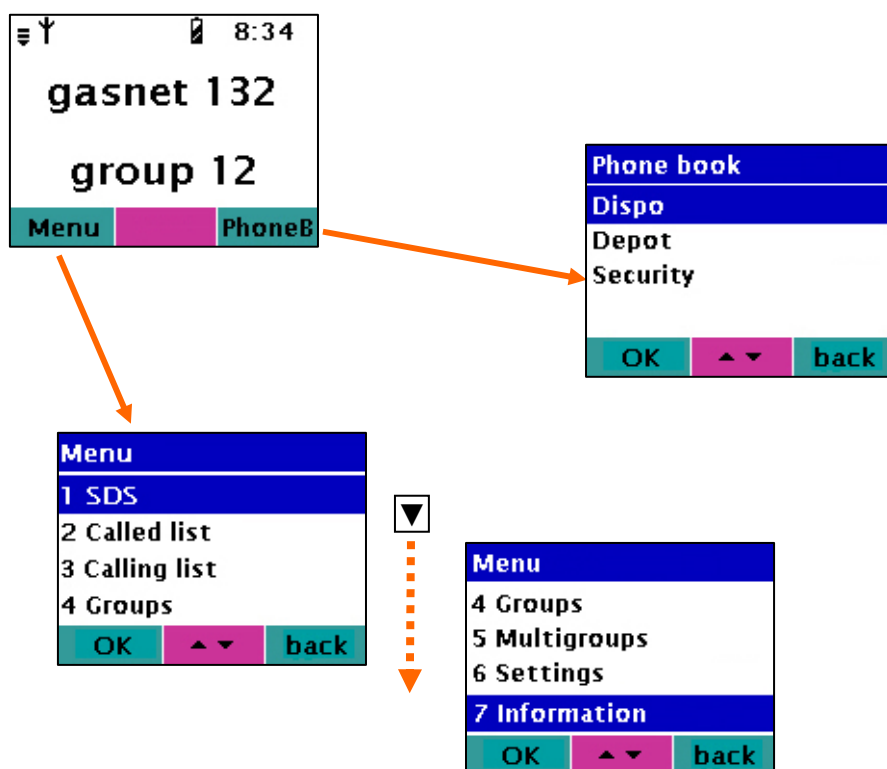
At the upper edge of the display area, icons indicate the current operating status. The following table provides an overview of the icons used and a corresponding description.

Icon	Description
flashing	Network scan
	In the network (registered)
	Field strength
flashing	Incoming duplex call
	Duplex connection active
flashing	Incoming simplex call
	Simplex connection active
	Battery charging status, in the form of a ticker during charging, flashes if a temperature fault occurs during charging
	Direct mode switched on
flashing	Message received (reading not acknowledged with OK)
	Key lock enabled
	Air Interface Encryption enabled
	Receive during voice call
	Transmit during voice call
8:34	Time

6.4 Menu System

6.4.1 General Structure

When the radio set is ready for operation, the "Menu" softkey can be used to switch to the menu system. Use the scroll keys to select a submenu and confirm the selection with the "OK" key.



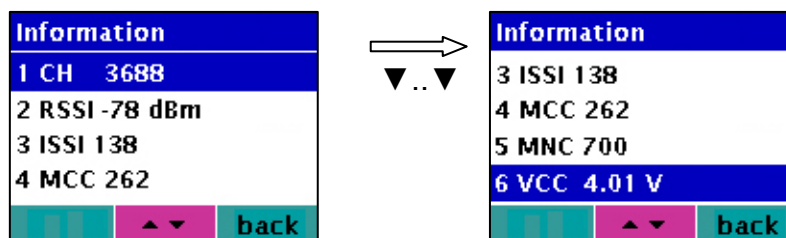
Press the "PhoneB" softkey to switch to the default telephone directory and directly set up a call in this directory.



6.4.2 Submenus

For the time being, the menu system provides the following submenus:

Menu:	Second menu level
1 SDS	Lists of sent and received text messages and status calls
2 Called list*)	List of the last incoming calls
3 Calling list*)	List of the last calls made
4 Groups	List of groups of the selected multigroup with display of the priority for scanning and listening in
5 Multigroups	List of several combined groups (group profiles)
6 Settings	List of various settable parameters and operating modes that can be selected on the next menu level:
	1 Operating mode
	2 Call Parameters
	3 Date - Time
	4 Language
	5 Factory settings (reset to default values)
	6 Mute (loudspeaker is switched off)
	7 Volume
7 Information	The Information menu item displays the following user data. They cannot be selected nor changed.
	• CH (current channel) • RSSI (current receive field strength) • ISSI (subscriber number of the Hand-held radio set) • MCC (country code of the TETRA network) • MNC (network code of the TETRA network) • VCC (current voltage at the rechargeable Lithium ion battery)



*) These menu items are hidden until calls have come in / calls have been made.

7 Volume Control

7.1 Direct Volume Control

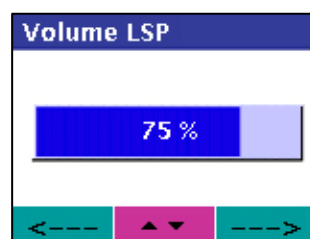
The volume can be controlled directly via rotary switch FS2. In this case, the volume of voice and tone signals are changed proportionally. While the volume is being controlled, the current value is displayed.



7.2 Volume Menu

When using the rotary switch FS2 or when pressing function button FT4 on the right-hand side of the radio set, the volume control menu is directly displayed. The value displayed can be changed either via rotary switch FS2 or via the softkeys FT5 and FT9 below the display.

The volume control menu can also be accessed via the general menu system as follows: Menu → Settings → Volume.



7.3 Signal Tone Volume Control

Signal tones are output to support operation, as a response to operator actions, when the device status changes, when messages arrive and for call processes. They are used as a confirmation, rejection or as a note/alarm.

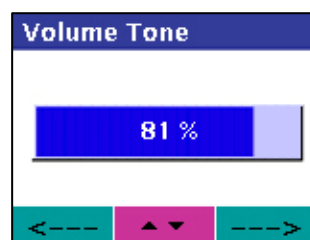
The most frequent signals:

- Signal for registering in the TETRA network (TMO) or for network scan
- Availability (release) of the voice channel and device ready to send (confirmation of the channel assignment with the PTT button pressed)
- Call signals for individual voice calls in simplex and duplex mode, end of a connection, call rejection
- Status call or text message transmitted or received
- Fault signal, low battery warning.

The volume of the signal tones can be set separately:

In the volume menu (Menu: "Volume LSP") you can use the scroll keys FT7 and FT8 below the display to switch to another menu for changing the signal tone volume relative to the overall volume.

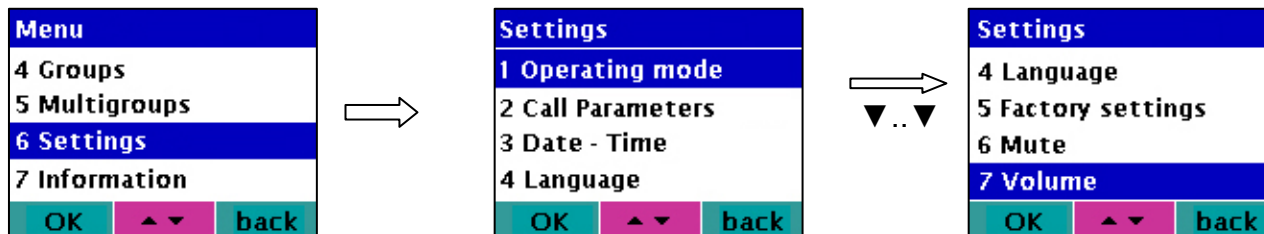
The value can be changed either via the softkeys or rotary switch FS2. The display will automatically return to the standard operating display (ready for operation) when no further are made (timeout).





8 Miscellaneous Device Settings

Menu "6 Settings" provides the following device settings for selection and change.

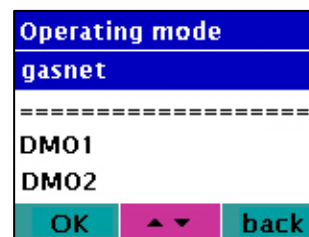


8.1 Operating Mode / Select Network

The "Operating Mode" menu item offers the possibility of switching between the operation in different networks and operation in direct mode on different frequencies. This feature depends on the default options of the radio set.

In the example to the right, one TETRA network "gasnet" and two direct mode configurations, DMO1 and DMO2 can be selected.

After you have selected the desired network using the scroll keys and confirmed your selection with the "OK" softkey, the radio set will switch to the selected configuration.





8.2 Call Parameters

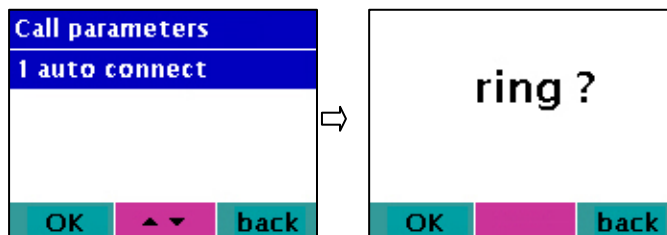
The parameters for outgoing voice calls that can be set via the "Call parameters" menu item depend on the default functions of your Hand-held radio set. The call parameters that can be changed for handling individual voice calls can be displayed and changed in Menu → Settings → Call parameters.

Default setting 1:

PTT button → Simplex call

M/OK key → Duplex call

Choice between automatic (direct call) and manual (hook signalling) call acceptance on the side of the called subscriber.

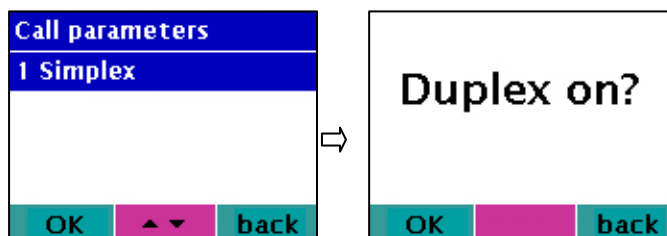


Default setting 2:

PTT button → direct call

M/OK key → telephone mode (ring tone)

Choice between duplex and simplex for individual voice calls.



When the menu is called, the currently set value is displayed first. When you acknowledge this value with "OK", a prompt for making a change, if desired, will be displayed. Once the change has been confirmed, the new call setting will be displayed.

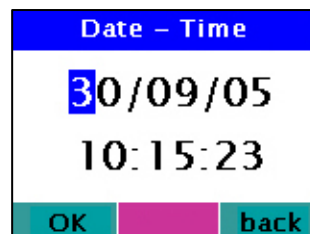


8.3 Date – Time

The date and time are always displayed as additional information for the detailed display in the called list, calling list and the list of incoming status calls and text messages. The time is also displayed in the header of the display.

To make this function available, the date and time must be entered after the radio set has been switched on.

After selecting Menu → 6 Settings → 3 Date - Time, enter the data via the keypad and save them with OK.



8.4 Language

The menu path Menu → 6 Settings → 4 Language displays the menu for selecting the language of the user interface.

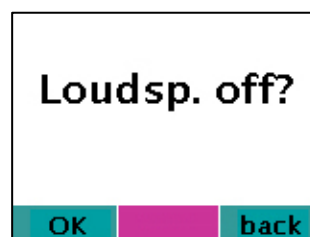


8.5 Factory Settings

If you confirm the "Factory settings" menu item, all the manual settings you made will be reset to the factory defaults.

8.6 Mute

When "Mute" is confirmed, the loudspeaker is switched off. As of this time, neither signal tones nor voice will be heard since the loudspeaker is disabled. This setting may be of interest if only status and text messages are to be used in very noisy environments, or if mute operation is desired. The loudspeaker can be enabled again in the same menu. Before the loudspeaker is switched off, you have to confirm a prompt with OK.



8.7 Volume

Menu → 6 Settings → 7 Volume displays the menu for volume control. Use the scroll keys below the display to switch to the menu for changing the volume of signal tones and to the menu for changing the display brightness. Menus can also be called directly and values can be changed directly via the rotary switch and the function buttons/keys (refer to 5.6.2, 5.7.4.1 and 5.7.7.1).



9 Individual Voice Calls

As opposed to group calls that reach a group of subscribers with a single call, individual voice calls are established by dialling the number of a single subscriber.

9.1 Simplex and Duplex Transmissions

In simplex mode, voice data are always transmitted in only one of two possible directions. The desire to send voice data (i.e. to talk) is transmitted to the network infrastructure via the PTT button, which then grants the radio set the permission to send. In this context, the network controller may treat the radio communications subscribers with different priorities when granting the permission to send. Dispatcher terminals, for example, are often processed with a higher priority.

In a duplex mode connection, both the radio sets can transmit and receive permanently. If a call is established to the PSTN through a specific prefix, the call is automatically established in duplex mode.

9.2 Call Setup Variants

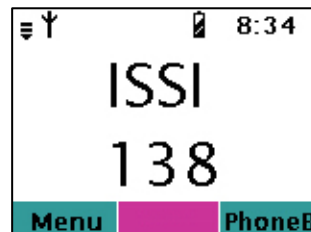
- It is possible to set defaults for the radio set that provide for the setup of a direct call when a call is initiated via the PTT button. In the case of a direct call, the receiver need not actively accept the call. The called radio set will automatically switch to the receive status.
If the same radio set is used to initiate the call via the M/OK key (FT6), the receiver must accept the call after the ring tone just as in the case of a standard telephone (hook mode).
- Alternatively the radio set can be programmed with default values that cause every individual voice call initiated with the PTT button to be set up in simplex mode and each call initiated with the M/OK key (FT6) to be set up in duplex mode (refer to 8.2 Call parameters).



9.3 Entering the Call Destination via the Keypad

In standard operating status (ready for operation), an individual voice call is made by entering the subscriber number via the keypad and then pressing either the PTT button or the M/OK key (refer to 8.2 Call parameters).

When the first digit is entered, ISSI is displayed in the top line to indicate that an individual subscriber number is entered. Faulty inputs can be deleted by pressing the Escape/Clear key briefly, or, if complete inputs are to be deleted, by pressing it for an extended period of time.

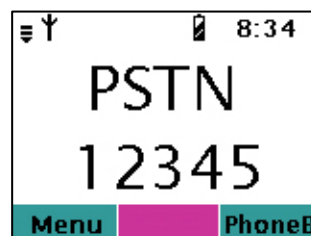


When all the entered or preset digits have been deleted, "dial" will be displayed in the top line as a prompt to enter a subscriber number. For radio communication fleets with long subscriber numbers that differ only in the last digit, the identical leading digits can be pre-programmed in the radio for ease of operation. When entering digits via the keypad, the pre-programmed leading digits will then automatically be prepended. If a completely different subscriber number is to be called, these automatically prepended digits must first be deleted.



A connection to the PSTN is always set up in duplex mode. In the radio set, a specific prefix made up of one, two or three digits, e.g. "00" is pre-programmed as a feature. When this prefix is entered, the following digits are interpreted as a subscriber number.

When entering this prefix, the display switches from "ISSI" to "PSTN" (public switched telephone network) and the subscriber number entered is displayed in the bottom line without the prefix previously entered (input in our example: 00 12345).



The display returns to the standard operating display if no other input or confirmation is made within 5 seconds.

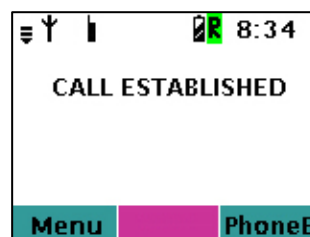


9.4 Call Setup

During call setup up to the automatic or manual call acceptance, the handset icon (in duplex mode) or the radio set icon (in simplex mode) in the header will flash.

Once the connection has been established, the respective icon will be displayed permanently and the message "CALL ESTABLISHED" will be displayed.

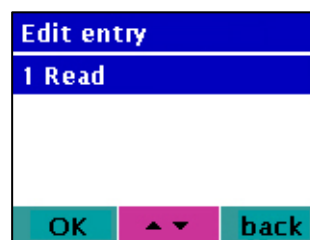
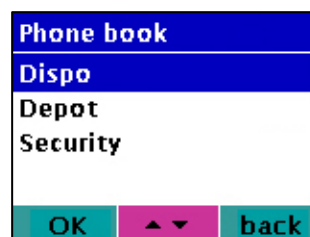
If the called subscriber answers when accepting the call, i.e. if he transmits, the icon R for "Receipt" is displayed in the header and the illuminated ring on top of the device is also lit in green.



9.5 Using the Phonebook

If the "PhoneB" softkey is pressed when the radio set is ready for operation, a telephone directory, i.e. a list of pre-programmed call destinations with the associated names and subscriber numbers is displayed. The names are displayed in the list. The desired destination can be selected via the scroll keys or the rotary switch FS1 and the call can be transmitted by pressing the PTT button or the M/OK key.

Press the "OK" softkey to open the selected entry for editing.

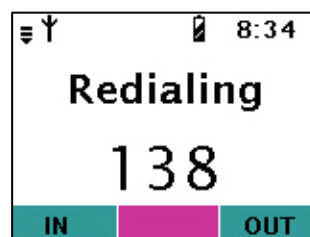


When "OK" is pressed again, the name and subscriber number of the phonebook entry are displayed.



9.6 Redialling

When the M/OK key (FT6) is pressed in standard operating mode (ready for operation) of the radio set, a menu for redialling is displayed. The subscriber number dialled last (138 in our example) is displayed. If several subscriber numbers have already been dialled and/or calls have already come in, the menu footer offers direct access to the Called list ("OUT") and/or to the Calling list ("IN") via the softkeys. In the lists, you can use either a number you dialled earlier on or the number of a calling party for redialling.



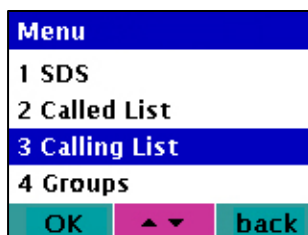
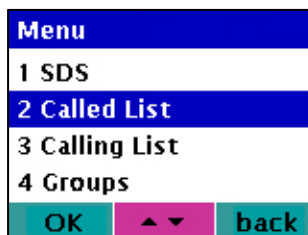
9.7 Using the Calling List and Called List

If the desired subscriber number has already been dialled after the radio set has been switched on, or if this subscriber number has called your radio set, a corresponding call can be set up in the Called list and Calling list submenus. The desired subscriber number can be selected using the scroll keys (FT7 and FT8) or the rotary switch FS1. Then the call is transmitted via the PPT button or the "OK" / M/OK key (FT6). (also refer to Chapter 9.2)

If a subscriber listed in the Calling list is called, the associated subscriber number / name is deleted from the Calling list and saved in the Called list instead.

The entries in the two lists can be deleted via the Escape/Clear key (FT10).

While group calls are not saved in the Calling list, the Called list also saves the called groups.



9.8 Accepting Incoming Voice Calls

An incoming individual voice call is indicated through a call signal (ring tone).

In addition, an incoming call is displayed as follows:

- Flashing radio set icon for a simplex call, or
- Flashing handset icon for a duplex call or telephone call, and
- The number of the calling party is displayed.

If the number is saved in the phonebook together with a name (Alias), the corresponding name will be displayed instead of the subscriber number.

Individual calls can be accepted either with the PTT button or with the M/OK key. If you accepted a call with the PTT button, you can talk at once as long as you keep pushing the PTT button.



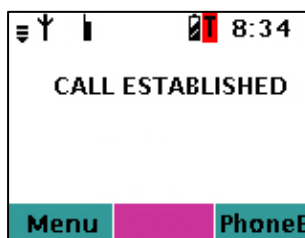
9.9 Connection Status

In an existing simplex connection, the desire to talk must be signaled to the network infrastructure by pressing the PTT button. If the call partner is not transmitting, the permission to transmit is granted almost immediately, which is signalled acoustically through a short "blip".

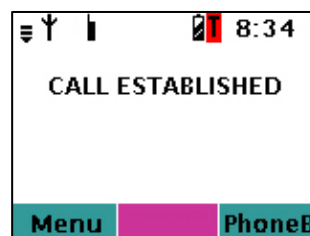
The PTT button must be pressed for as long as you want to transmit. The voice channel is released when you stop pressing the PTT button.

While transmitting, a T (Transmit) on a red background is displayed in the header of the display, and while receiving, an R (Receive) with a green background is displayed.

At the same time, the illuminated ring on the top of the radio set lights up in the corresponding colour.



Example 1: 132 has called 138, a connection has been established in simplex mode. Top: 132 is transmitting; bottom: 138 is receiving.



If the connected unit interrupts the transmission by releasing the PTT button, the green R icon in the display will vanish and a short acoustic signal ("Roger beep") will indicate that the connection partner can transmit.

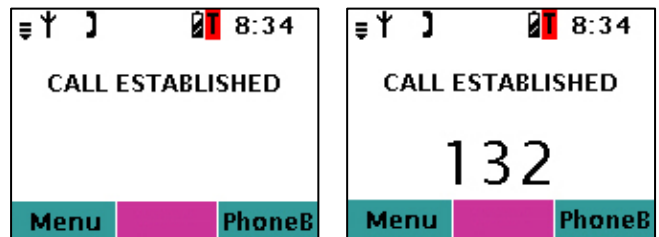


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In an active duplex connection, the two radio sets transmit at the same time. The use corresponds to that of mobile phones.

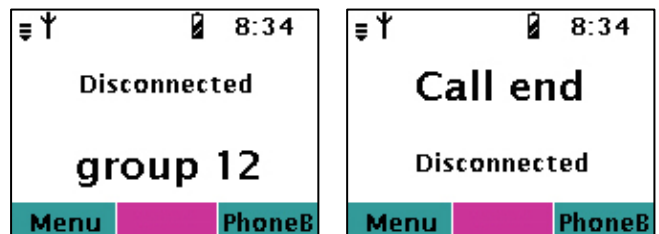
During this connection, the PTT button has no function.



Example 2: 132 has called 138, a duplex connection has been established

9.10 Terminating the Connection

An individual voice connection is terminated by pressing the Escape/Clear key (C-key).





10 Group Calls

10.1 General

10.1.1 Group Calls, Selected Group

The term group refers to a selected circle of radio communications subscribers, who are characterized by an especially close, direct and frequently recurring, task-related communication relationship. A group call is a voice call that reaches all the radio communications subscribers that belong to the called group. In a group call, only one radio communications subscriber at a time may transmit, while all the others receive. A group call can also be established when one or multiple members of this group cannot be reached because they have another active connection or because their radio set is switched off.

To facilitate the communication with the group, with the larger part of the communication takes place, you have the possibility of selecting this group as your own group in a pre-programmed list (Selected group). When the radio set is ready for operation, this group is displayed in the bottom line of the display. The selected group can be dialled simply by pressing the PTT button.



10.1.2 Scan Lists, Multigroups

In addition to the selected group, each subscriber of a group may also belong to other groups, the radio communication of which is also heard. The relationship to other groups, however, may be handled with a different priority. For this purpose, a list of these groups has been pre-programmed in the radio set. If a radio set is to be used for various applications, it must be possible to toggle between different lists, i.e. between different multigroups.

In the TETRA radio communications network, the group list with the desired scan properties of each group are aligned with the infrastructure upon switching on and logging in to the network. In this case, it may be possible that the user is denied the membership of specific groups or that the radio communications subscriber is assigned additional groups (dynamic groups). The assignment of dynamic groups can also occur at any other point of time.

The current status of the scan list or of the groups with their properties in the selected multigroup can be displayed in the menu system via the path Menu → 4 Groups and changed, if required. Each change is aligned with the infrastructure.



10.1.3 Selecting a Group, Scan Properties

Turn the Select group switch FS1, press function button FT3 or use the menu path: Menu → 4 Groups to open the list of groups that belong to the currently selected multigroup (in this case: "GAS Admin"). In this submenu, the header displays the pre-programmed designation for the selected multigroup and below it all the groups with the registered scan priority. Non-pre-programmed, dynamically assigned groups may also be listed here.

GAS Admin		
(N) Dispo		
(N) Gruppe 11		
(S) Gruppe 12		
Change	▲ ▼	back

A group may be assigned the following properties or scan priorities:

- 1 (S) Selected (scanned and selected group)
- 2 (L) Low priority (scanned with low priority)
- 3 (N) Normal priority (scanned with normal priority)
- 4 (H) High priority (scanned with high priority)
- 5 (-) Not scanned
- 6 (D) Detached (detached by User)

scan priority		
1 (S) Selected		
2 (L) low priority		
3 (N) normal priority		
4 (H) high priority		
OK	▲ ▼	back

Press softkey FT5 (Edit) to open a Scan Priority submenu for the group previously selected through scrolling and to select one of the properties listed above.

Properties that may be displayed but that cannot be edited by the user:

- (P) Detach permanent (permanent disconnect by basic station)
- (BL) SwMI locked (locked by basic station)
- (BS) Always scanned (scanning cannot be disabled)
- (D1) Detach temporary 1
- (D2) Detach temporary 2
- (R) Detach Rejected
- (?) Not (yet) confirmed by infrastructure

scan priority		
3 (N) normal priority		
4 (H) high priority		
5 (-) Not scanned		
6 (D) Detached		
OK	▲ ▼	back

If only "Group 12" (selected in the above example) is to be scanned and if "Group 11" is to be selected in the further process, this is possible directly by scrolling to group 11 in the list of groups and then confirming your selection with the M/OK key.

Via the path Menu → 5 Multigroups you access the menu for replacing a multigroup or scan list with another multigroup or scan list. Selection "1 No group" detaches all the groups. This means, there will be no participation in group calls any longer, unless new groups are assigned dynamically by the infrastructure.

Multigroups		
1 No group		
2 GAS Admin		
3 Security		
4 GAS Service		
OK	▲ ▼	back

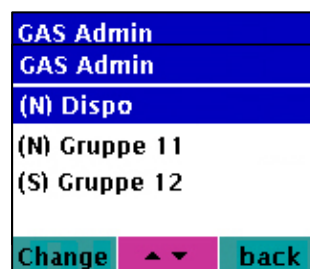


10.2 Establishing a Group Call

Press the PTT button when the radio set is ready for operation to immediately establish a group call to the group displayed in the bottom line (in this case, "Group 12").

If a group call is to be established to a group other than the selected group, this group must be selected in the Groups list. You can access this list via the Select group rotary switch FS1 or by pressing function button FT3.

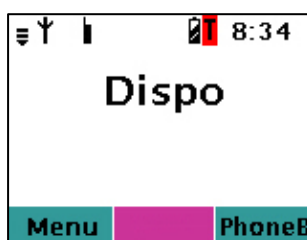
In the present example, we want to establish a call to the group "Dispo". Once the group has been selected using the scroll keys or rotary switch FS1, press the PTT button to initiate the group call. Note: in this case, pressing the M/OK key would not result in call setup but would define the group "Dispo" as the selected group.



10.3 Connection Status

During an active group connection, the name or number of the called group will be displayed in the top line of the display.

In the bottom line, first the initiator of the group call is displayed and then the transmitting radio communications subscriber with the associated subscriber number or pre-programmed name.



Example: 132 has called the group "Dispo" and is transmitting; 138 can see that 132 is

The desire to transmit must be signalled to the network infrastructure by pressing the PTT button. If no other subscriber is transmitting at this time, a permission to transmit will be sent, indicated acoustically by a short "blip". Keep pressing the PTT button for as long as you wish to transmit. During the transmission, the T-icon (Transmit) on a red background is displayed. The illuminated ring on the top of the radio set will also light up in red during the transmission.

The voice channel is released as soon as the PTT button is not pressed any longer. A "Roger beep" is to be heard on the connected unit and the green R-icon (Receive) in the display of the receiving side will go out. Then, another group call subscriber can transmit.



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While a group connection is active, the infrastructure broadcasts information on the active group call in short intervals. This gives every radio communications subscriber scanning this group and who missed the beginning of the group call, the possibility of joining the group connection later on (Late entry). This may be the case after leaving a radio shadow or after switching on the device.

If a radio communications subscriber wants to leave an active group connection, e.g. to establish another call, he simply needs to press the Escape/Clear key (C-key). A group connection is terminated either through inactivity (timeout) of all the connection subscribers or when the radio communications subscriber, who initiated the group call, presses the C-key. These functions depend on the settings in the radio communications network and may have been implemented differently depending on the manufacturer of the infrastructure.

The end of a group call is displayed in the same way as that of an individual voice call.

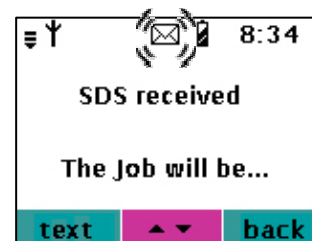
11 Status Calls and Text Messages

In TETRA radio communications networks, you have the possibility of transmitting short messages in the form of data telegrams without occupying a voice channel. In this case, status calls and text messages or short data (SDS – Short data service) are distinguished. Status calls are transmitted as a number. This requires that all the radio communications subscribers use the same information content for the same status number. Generally, this information is pre-programmed in the radio sets. Text messages (SDS) are free texts that are entered as an alphanumeric character string, i.e. in the form of text, via the keypad and transmitted as such to the recipient. Status calls and text messages may be sent to individual radio communications subscribers as well as to groups.

11.1 Receiving Status Calls and SDS

When receiving a status call or SDS, the messages "State received" or "SDS received" as well as the number of the status call or - if pre-programmed - the corresponding clear message text (in this example: "Job is finished") will be displayed.

The envelope icon will flash in the header.



When an SDS has been received, only the beginning of the text will generally be visible since the complete text message cannot be displayed all at once.

Press the "Text" softkey to open a new "Text" menu display. In this window the received status messages or SDS can be read completely, including information on the subscriber number of the transmitter and the date and time the message was received. Only when this open text window has been acknowledged with the OK softkey will the flashing SDS icon (letter icon) be switched off in the standard operating display of the radio set. The message is assumed read. The flashing SDS icon will be reactivated as soon as a new message arrives.

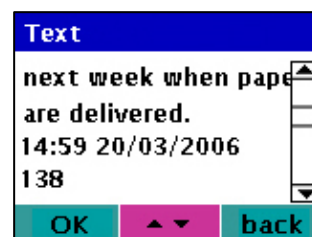
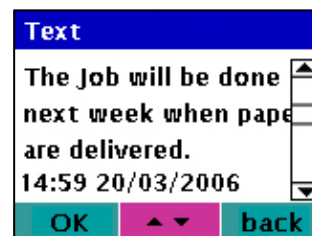


11.2 Reviewing Status Calls and SDS via the Menu System

The navigation path "Menu → 1 (SDS) → 1 Received" opens a list of received status calls and SDS. After selecting the messages of interest using the scroll keys and confirming your selection with the "Text" softkey, the complete message text will be displayed. Our example shows a long SDS.

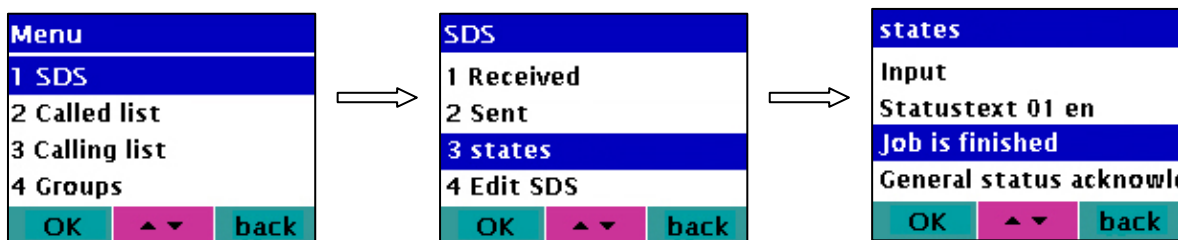
The scroll bar on the right-hand side of the display means that the rest of the text, the time and the subscriber number of the text message transmitter will become visible when scrolling. The subscriber number of the text message transmitter is identified with an exclamation mark.

When none of the messages in the list are of interest any longer, the complete list can be deleted with the C-key.



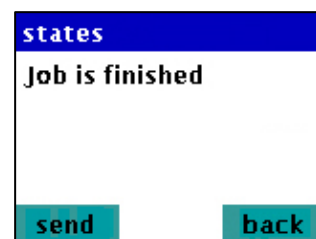
11.3 Transmitting a Status Call

To transmit a status call, you first have to select the status call to be sent via the navigation path SDS → Status.



11.3.1 Transmitting a Pre-programmed Status Call

If a status predefined in the selection list is confirmed with OK, a submenu offers this status for transmission including its complete text. Press the "back" softkey to return to the selection menu for status calls without transmitting the status call.



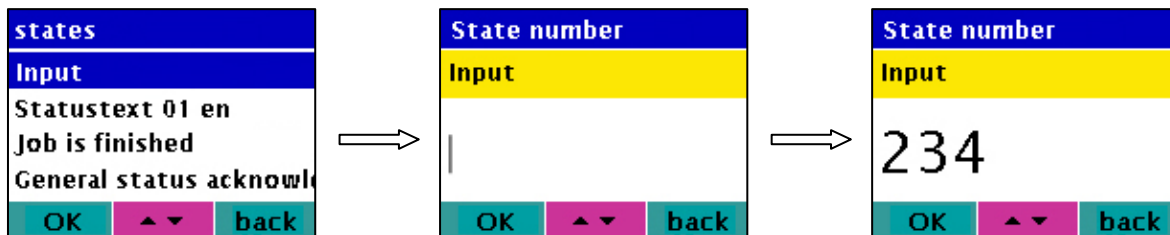
After confirming the status message with the "Send" softkey, the main menu is displayed again and you are prompted to enter the destination. You can either enter the destination via the keyboard or you can select a destination in the phonebook.

If the M/OK key is now pressed without having entered a destination number, the status is transmitted to the subscriber number you dialled last (enabling of the redialling function). If the "Send" softkey is pressed again without having entered a call destination, the status is sent to your own group (the "selected group").

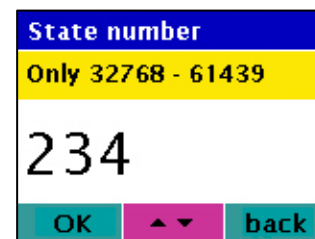


11.3.2 Transmitting a Status Number

If you select "Input" in the selection menu for status calls, an input menu for a freely selectable status number (without programmed text context) is displayed. The status number to be sent is entered via the numeric keypad. Upon confirmation with the "OK" softkey, the main menu is displayed and a prompt asks you to enter the call destination for the status message.

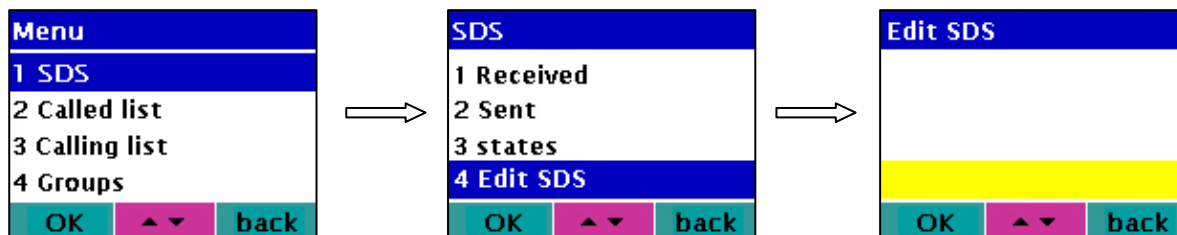


When entering the status number, take into consideration that only the numbers in the range of from 32768 to 61439 are available for free use. If you do not observe this restriction, a fault message like the one in the figure to the right will be displayed.



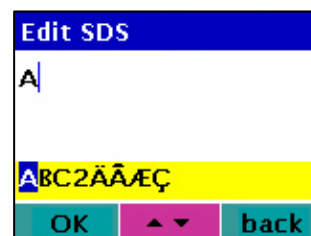
11.4 Transmitting a Text Message (SDS)

An SDS is a text message that can be entered freely. To transmit a text message, first an editor window is opened via the navigation path Menu "SDS" and the "Edit SDS". In this window, you can enter the message via the keyboard.



The text is entered via the keypad. After pressing one of the alphanumeric keys, an information line will appear in the lower part of the display showing the character set available for the key you just pressed. Use the *-key to toggle between upper-case and lower-case letters as well as other special characters of the character set..

For upper-case letters, the background of the information line is yellow-orange, for lower-case letters green, and for special characters red.



The input is confirmed with the "OK" key. The menu will then switch to the main display with the prompt to enter the destination for the text message.

Once the call destination has been entered, the text message will be sent as soon as you have confirmed your input with the "Send" softkey.





12 Technical Data

12.1 General technical data

Operating temperature	-20 °C...+55 °C
Transport & Storage temperature	Hand-held radio -20 °C...+60 °C
	Battery
	-20 °C...+60 °C max. one month (without recharge)
	-20 °C...+45 °C max. three month (without recharge)
	-20 °C +25 °C max. one year (without recharge)
Protection class	IP 54
Frequency range	300-512MHz
Channel pattern, programmable	6,25 / 12,5 / 25 kHz
Transmission mode	simplex, semi duplex
Modulation type	$\pi/4$ DQPSK, frequency modulation, phasing modulation
1 Interface	V.24 LVTTTL
1 Accessory interface	Earphone
1 Accessory interface	for active microphone loudspeaker

12.2 Technical data: Transmitter

Meets following standard	ETS 300 392-x; ETS 300 394-2-1; ETS 300 396-2 Part 2
Transmission power	max. 1 W
Transmission lock-out	in accordance with thermal situation of hand-held radio

12.3 Technical data: Receiver

Meets following standard	ETS 300 392-x; ETS 300 394-2-1; ETS 300 396-2 Part 2
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12.4 Technical data: Battery

Battery model	Lithium-Ion
Power supply	3,7V
Capacity	ca. 3000 mAh
Operating temperature	-20 °C...+55 °C
Transport temperature	-40 °C...+70 °C (short time)
Storage temperature	-20 °C...+60 °C max. one month (without recharge)
	-20 °C...+45 °C max. three month (without recharge)
	-20 °C +25 °C max. one year (without recharge)



ATEX-TETRA-Handheld Radio BHR 21 IS

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13 Marking

Marking of the ATEX -certificate

ZELM testing institute ZELM Ex Braunschweig

06 year of certificate

0319 certificate number

X it indicates that the equipment is subject to special conditions for safe use

ZELM 06 ATEX 0319X



Registering mark of devices and equipment for operating in hazardous areas / Ex-zones

Marking of protection class

II Einsatz nur Übertage

2 category 2 = zone 1 = temporarily, potentially explosive atmosphere

G gas protection class

EEx marking of approval according to EC-directive 94/9/EC = ATEX

ib the device is intrinsically safe

IIC gas group IIC, gases with max. explosion hazard

T4 temperature class 4, max. temperature of device's surface 135 °C

3 category 3 = zone 2 = intermittent hazardous atmosphere

D dust protection class

T130°C max. temperature of device's surface 130°C

IP54 protected against dust and water jets

**II 2 G EEx ib IIC T4
II 3 D T130°C IP 54**

CE 0820 2007

The device meets european requirements and standards of ATEX handheld radios.

0820 is the number of testing institute ZELM Ex Braunschweig, that has tested the production. Production year is 2007.



Once the service life of a product has ended, this product must not be disposed of in the standard domestic refuse. Even disposal via the municipal collection points for electric and electronic wastes is not permitted. Please revert to your local service representative or directly to PMRS GmbH to dispose of the product.



This product is made of components, which are a part of cycle of potential recyclables. Please recycle it.



Note the user manual !

55000759

Order Number of battery BHR 21 IS



ATEX-TETRA-Handheld Radio BHR 21 IS

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14 Scope of delivery

You get the ATEX-Hand-held radio BHR 21 IS with:

- Hand-held radio with screwed on clip holder
- Antenna
- Belt-clip
- User manual
- Copy of the EC-TYPE-EXAMINATION CERTIFICATE

15 Notice



ATEX-TETRA-Handheld Radio BHR 21 IS

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Prüf- und Zertifizierungsstelle

ZELM Ex



(1) EC-TYPE-EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - **Directive 94/9/EC**

(3) EC-TYPE-EXAMINATION CERTIFICATE Number:

ZELM 06 ATEX 0319 X

(4) Equipment: **Handheld Radio type BHR 21 IS**

(5) Manufacturer: **PMRS GmbH Servicegesellschaft für Professionellen Mobilfunk**

(6) Address: **Tränkeweg 5, D-15517 Fürstenwalde**

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Prüf- und Zertifizierungsstelle ZELM Ex, notified body No. 0820 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report ZELM Ex 1220619494.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014:1997 + A1+A2

EN 50020:2002

EN 50281-1-1:1998

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this Certificate.

(12) The marking of the equipment shall include the following:



II 2 G EEx ib IIC T4 and II 3 D T130 °C IP54

Zertifizierungsstelle ZELM Ex

Braunschweig, January 26, 2007

H. Zelm
Dipl.-Ing. Harald Zelm



Sheet 1/3

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.

Prüf- und Zertifizierungsstelle ZELM Ex • Siekgraben 56 • D-38124 Braunschweig



Prüf- und Zertifizierungsstelle

ZELM Ex



SCHEDULE

(13)

(14)

EC-TYPE-EXAMINATION CERTIFICATE ZELM 06 ATEX 0319 X

(15) Description of equipment

The Handheld Radio type BHR 21 IS serves for the transfer of signals within explosion hazardous areas.

Maximum permitted ambient temperature range: -20 °C to +55 °C

Electrical data

Internal electric circuits:

Supply:

type of protection Intrinsic Safety EEx ib IIC
from a corresponding lithium-ion-battery

Transmission power up to 1 W

External electric circuits:

Microphone loudspeaker-circuit and earphone circuit (Audio Connector):

type of protection Intrinsic Safety EEx ib IIC
Only for connection to certified control elements.
maximum values:

$U_o = 4.2 \text{ V}$ with $I_o = 2.3 \text{ A}$

resp.

$U_o = 9.8 \text{ V}$ with $I_o = 110 \text{ mA}$ $P_o = 115 \text{ mW}$

characteristic curve partially linear (9.8 V to 4.2 V) and partially rectangular, the break point is 4.2 V

maximum permitted external capacitance $C_o = 1.0 \text{ } \mu\text{F}$

maximum permitted external inductance $L_o = 10 \text{ } \mu\text{H}$

I/O connector circuit:

type of protection Intrinsic Safety EEx ib IIC
Only for connection to certified control elements.
maximum values:

$U_o = 4.2 \text{ V}$ with $I_o = 160 \text{ mA}$

resp.

$U_o = 9.8 \text{ V}$ with $I_o = 110 \text{ mA}$ $P_o = 115 \text{ mW}$

characteristic curve partially linear (9.8 V to 4.2 V) and partially rectangular, the break point is 4.2 V

maximum permitted external capacitance $C_o = 1.0 \text{ } \mu\text{F}$

maximum permitted external inductance $L_o = 0.8 \text{ mH}$

Charging jack:

Only for the connection to the corresponding charging set.

(16) Report No.

ZELM Ex 1220619494

Sheet 2/3

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ATEX-TETRA-Handheld Radio BHR 21 IS

PMRS



Prüf- und Zertifizierungsstelle

ZELM Ex



Schedule to EC-TYPE-EXAMINATION CERTIFICATE ZELM 06 ATEX 0319 X

(17) Special conditions for safe use

1. The operating instructions have to be considered. The loading of the battery may only be done outside of the explosion hazardous area and only with the corresponding charging set.
2. In case of harm of the device or battery pack and lacquer damages > 2cm² at battery pack or front of the device, the device has to be removed from operation and the explosion hazardous area immediately.
3. The Handheld Radio may only be operated with firmly screwed on, undamaged antenna.
4. The audio connector has to be covered in the dust explosion hazardous area with either the corresponding cover or with a separate certificated accessory. The accessory is not allowed to be changed in the dust explosion hazardous area.
5. External equipment may only be connected at the audio connector, if the conductors of the incoming line have at least a cross-section 0.0314 mm².
6. The Handheld Radio may only be used in the permitted ambient temperature range of -20°C to +55°C.
7. The Handheld Radio may be used without an additional case. It may be also used with the corresponding leather case with the number 55000859.

(18) Essential Health and Safety Requirements

met by standards

Zertifizierungsstelle ZELM Ex

St. Zelm
Dipl.-Ing. Harald Zelm



Braunschweig, January 26, 2007

Sheet 3/3

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ATEX-TETRA-Handheld Radio BHR 21 IS

PMRS

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